

**Grade Four**  
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**Correlations with Oklahoma**  
**Instructional Mathematical Goals and Objectives**

The following concepts and skills are required by all students completing fourth grade. The **Major Concepts** should be taught in depth using a variety of methods and applications so that all students have accessibility to and an understanding of these concepts. **Maintenance Concepts** have been taught previously and are a necessary foundation for success in mathematics at this level.

**MAJOR CONCEPTS**

**Patterns-Extend Rules, Functions**

**Number Sense-**

**Place Value-6 Digits, Estimation  
Decimals to 100ths**

**Operations-**

**Multiplication, Division Facts 0-10  
Fraction Concepts**

**Geometry-Lines, Angles**

**Measurement-Metric,**

**Length, Weight, Area**

**Data Analysis-Probability**

**Concepts, Interpret Graphs**

**MAINTENANCE CONCEPTS**

**Patterns-Rules**

**Number Sense-**

**Place Value-4 Digits,  
Fractional Concepts**

**Operations-**

**Add, Subtract with Multidigits,  
Multiplication Facts  
2s, 3s, 4s, 5s, 10s**

**Geometry-Area, Perimeter**

**Measurement-**

**Weight, Length, Estimation**

**Data Analysis-Pictographs**

**THINK STAR** ★

Use the image of a star with **Content** at its center and **Problem Solving, Communications, Connections, Reasoning, and Representation** at its five points to design illuminating lessons (see page 77).

**KEY TO SUCCESS!**

When introducing new concepts **CONNECT** from Concrete -> Pictorial -> Abstract

**I. Patterns**

- A. Discover, describe, extend, and create a wide variety of patterns using tables, graphs, rules, and models (e.g., use 1-inch tiles to demonstrate that as the length of the side of a square doubles, the area more than doubles, explore the characteristics of odd and even numbers, extend patterns of geometric shapes). **Appetizers 1 F; 2 B; Main Dish Objective 1 (Number Concepts) lesson 6; Objective 2 (Mathematical Relations) lesson 2; Applications; Final Tests; Reasonableness Problems**

- B. Use patterns to develop elementary **function** concepts (e.g., use calculators and computers to explore patterns, use **function machines** and “t-tables” to demonstrate “what is the rule?”). **Appetizers 2 B; Main Dish Objective 2 (Mathematical Relations) lesson 2; Applications; Final Tests; Reasonableness Problems**
- C. Evaluate simple **expressions** (e.g., if  $a = 3$ ,  $b = 2$ , and  $c = 1$ , what is  $a + b - c$ ?). **Appetizers 2 A; Main Dish Objective 2 (Mathematical Relations) lesson 1; Applications; Final Tests; Reasonableness Problems**

## II. Number Sense

- A. Use knowledge of place value to model, describe, and record whole numbers and decimals to tenths and hundredths (e.g., place value mats and counter, money, base-10 blocks to play a trading game, number lines, calculators, computers). **Appetizers 1 C and D; Main Dish Objective 1 (Number Concepts) lessons 3 and 4; Applications; Final Tests; Reasonableness Problems**
- B. Read, write, rename, model, compare, and order whole numbers through 6 digits (e.g., base-10 blocks, number lines, pictures of shaded regions of two- or three-dimensional figures). **Appetizers 1 B; Main Dish Objective 1 (Number Concepts) lesson 2; Applications; Final Tests; Reasonableness Problems**
- C. Represent, compare, and order decimals to 100ths (e.g., build 2 numbers with base-10 blocks on a place value mat and compare). **Appetizers 1 E; Main Dish Objective 1 (Number Concepts) lesson 5; Applications; Final Tests; Reasonableness Problems**
- D. Write the expand form of 5- and 6-digit numerals (e.g.,  $367,503 = 300,000 + 60,000 + 7,000 + 500 + 0 + 3$ ). **Appetizers 1 C; Main Dish Objective 1 (Number Concepts) lesson 3; Applications; Final Tests; Reasonableness Problems**
- E. Apply estimation skills when adding and subtracting fractions with like denominators and decimals of the same place value (e.g., determine that  $7/8 + 5/8$  must be more than one since both are more than  $1/2$ ).

## III. Number Operations and Computations

- A. Develop fluency with single-digit multiplication facts and their related division facts. **Appetizers 2 A; Main Dish Objective 2 (Mathematical Relations) lesson 1; Applications; Final Tests; Reasonableness Problems**
- \*B. Use multiplication and division facts to compute related problems (e.g.,  $30 \times 5$ ,  $300 \times 5$ ,  $3 \times 50$ ). **Appetizers 8 A; 9 B; Main Dish Objective 8 (Multiplication) lesson 1; Objective 9 (Division) lesson 2; Applications; Final Tests; Reasonableness Problems**

- C. Develop multiplication and division **algorithms** (e.g., use physical materials, show multiplication as repeated addition, as a geometric array, as the inverse of division, ask students to explain why certain steps in an **algorithm** work). **Appetizers 8 A; Main Dish Objective 8 (Multiplication) lesson 1; Applications; Final Tests; Reasonableness Problems**
- D. Apply a variety of estimation and mental math techniques to simplify computations (e.g., add or subtract by 10s or multiply by 100).
- E. Develop benchmarks (e.g., 0,  $1/2$ , and 1, 0, .5, and 1) for fractions and decimals and place them on a number line. **Appetizers 2 C; Main Dish Objective 2 (Mathematical Relations) lesson 3; Applications; Final Tests; Reasonableness Problems**
- F. Demonstrate equivalent fractions using physical models and pictures of fraction models. **Appetizers 1 G; Main Dish Objective 1 (Number Concepts) lesson 7; Applications; Final Tests; Reasonableness Problems**
- \*G. Create models of like and unlike fractional parts to be combined or subtracted (e.g., egg cartons, fraction strips, circles, and squares).

#### IV. Geometry and Spatial Sense

- A. Identify, draw, and construct models of intersecting lines, parallel lines, and perpendicular lines (e.g., use spaghetti, straws, toothpicks).
- B. Compare angles equal or less than 90 degrees (e.g., use right angles to determine the approximate size of other angles; make a variety of angles using flexible straws and compare). **Appetizers 3 D; Main Dish Objective 3 (Geometry) lesson 4; Applications; Final Tests; Reasonableness Problems**
- C. Describe, compare, classify, and construct two- and three-dimensional figures (e.g., name three-dimensional shapes found in the classroom, predict results of combining, subdividing, and change shapes by folding paper, dissecting, tiling, and rearranging pieces of solids). **Appetizers 3 A; Main Dish Objective 3 (Geometry) lesson 1; Applications; Final Tests; Reasonableness Problems**
- D. Describe the effects on two- and three-dimensional objects when they slide (translate), flip (reflect), and turn (rotate). **Appetizers 3 C; Main Dish Objective 3 (Geometry) lesson 3; Applications; Final Tests; Reasonableness Problems**

#### V. Measurement

- A. Establish benchmarks for metric units and estimate the measures of a variety of objects (e.g., weight: raisin is about 1 gram, length: width of a finger is about 1 centimeter). **Appetizers 4 B and D; Main Dish Objective 4 (Measurement) lessons 2 and 4; Applications; Final Tests; Reasonableness Problems**

- B. Select an appropriate metric unit of measure to solve application problems involving length, perimeter, area, weight, time, money, and temperature. **Appetizers 4 A, C, D, and G; Main Dish Objective 4 (Measurement) lessons 1, 3, 4, and 7; Applications; Final Tests; Reasonableness Problems**
- C. Solve application problems involving time and temperature (e.g., elapsed time). **Appetizers 4 A; Main Dish Objective 4 (Measurement) lesson 1; Applications; Final Tests; Reasonableness Problems**

## VI. Data Analysis

- A. Read, interpret, and construct tables and graphs (e.g., bar, pictograph, line plots). **Appetizers 5 B; 12 B; Main Dish Objective 5 (Probability/Statistics) lesson 2; Objective 12 (Mathematical Representation) lesson 2; Applications; Final Tests; Reasonableness Problems**
- B. Design investigations, collect, organize, record, and interpret the data gathered based on the investigations (e.g., where could we go on a one-day trip in Oklahoma). **Appetizers 5 B; 12 B; Main Dish Objective 5 (Probability/Statistics) lesson 2; Objective 12 (Mathematical Representation) lesson 2; Applications; Final Tests; Reasonableness Problems**
- C. Examine data displays such as tallies, tables, charts, and graphs and use the observations to pose and answer questions (e.g., choose a table in social studies of population data and write computation questions or problems). **Appetizers 5 B; 12 B; Main Dish Objective 5 (Probability/Statistics) lesson 2; Objective 12 (Mathematical Representation) lesson 2; Applications; Final Tests; Reasonableness Problems**
- D. Use simple probability to investigate the likelihood or “chance” of events occurring in familiar contexts (e.g., how likely is rain today when the weather forecast indicates a 60% chance?) and in experiments (e.g., how likely is it that someone in the class whose name begins with S will be chosen?). **Appetizers 5 A; Main Dish Objective 5 (Probability/Statistics) lesson 1; Applications; Final Tests; Reasonableness Problems**
- E. Investigate and record probabilities by experimenting with devices that generate random outcomes (e.g., coins, number cubes, spinners). **Appetizers 5 A; Main Dish Objective 5 (Probability/Statistics) lesson 1; Applications; Final Tests; Reasonableness Problems**